

ABSTRACT

The invention relates to a method and device for identifying luminescent molecules according to the fluorescence correlation spectroscopy method. The inventive method comprising the following steps: a) preparing a sample (12) containing luminescent molecules; b) illuminating the sample (12) using an optical excitation device (2,4,6,8) comprising at least one light source, at least one, in particular, diffractive optical element (7) for splitting light passing therethrough into multiple beams, and a focusing optics (8) for focusing multiple light beams passing therethrough into multiple confocal volume elements; c) capturing emission radiation from the multiple confocal volume elements by means of a locally resolving sensor matrix arrangement (20), whereby the sensor matrix arrangement is a sensor matrix, which is comprised of avalanche photodiodes AD is produced using IC technology, particularly CMOS technology, and is integrated in a sensor chip (20) with Greiger-mode wiring, and; d) processing the signals, which are provided by the avalanche photodiode matrix, by means of a signal processing and evaluation device preferably integrated in the sensor chip.